FEDERAL - STATE COOPERATIVE

SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

Rio Grande Drainage Basin

By

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and other Federal, State and local organizations.

As of

APR. 1, 1951

FEDERAL-STATE COOPERATIVE
SNOW SURVEYS AND IRRIGATION
WATER SUPPLY FORECASTS

FOR

RIO GRANDE BASIN

Report Prepared

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WATER SUPPLY OUTLOOK
RIO GRANDE AND CANADIAN DRAINAGE BASINS
April 1, 1951

The water supply outlook for the Rio Grande and its tributaries is not favorable as of April 1. Snow cover along the Continental Divide is about 65 percent of normal. On the Sangre de Cristo range to the east of San Luis Valley the current snow cover is 50 percent of average. In northern New Mexico the snow fall has been extremely deficient with near minimum snow measurements on most courses for any April 1 since surveys were started in 1937. Precipitation has been deficient and soil moisture conditions are poor throughout the valley.

RIO GRANDE

Seasonal snow accumulation to April 1 along the Continental Divide to the west of San Luis Valley is about 65 percent of normal. To the east of the valley along the Sangre de Cristo and Culebra ranges snow cover is about 50 percent of normal. There is no snow on the valley floor or in the foothills. The summer flow of the Rio Grande, Alamosa and Conejos rivers will be about 50 percent of normal. The soil in irrigated areas is dry due to deficient precipitation during the past several months. Storage in irrigation reservoirs is about 15 percent of April 1, 1950 and much below the past average.

On the headwaters of the Rio Chama the snow cover is about 50 percent of normal and similar to a year ago. Elsewhere in northern New Mexico the snowfall has been very deficient with near minimum snow measurements on April 1. On the Rio Grande-Canadian Divide the snowfall has been slightly more than last year but much below the past average. Soil moisture conditions are described as poor in the middle Rio Grande area. Storage in El Vado Reservoir is now 5,100 acre-feet as compared to 22,000 acre-feet a year ago.

The combined storage in Elephant Butte and Caballo Reservoirs is now 405,000 acre-feet, about one-half of that stored on April 1, 1950. Soil moisture in the lower Rio Grande valley is reported as fair. Streamflow is well below normal.

There is practically no snow on the headwaters of the Pecos near Santa Fe. Storage in the Carlsbad project reservoirs is over 100,000 acre-feet, slightly less than last year but well above the past ten year average.

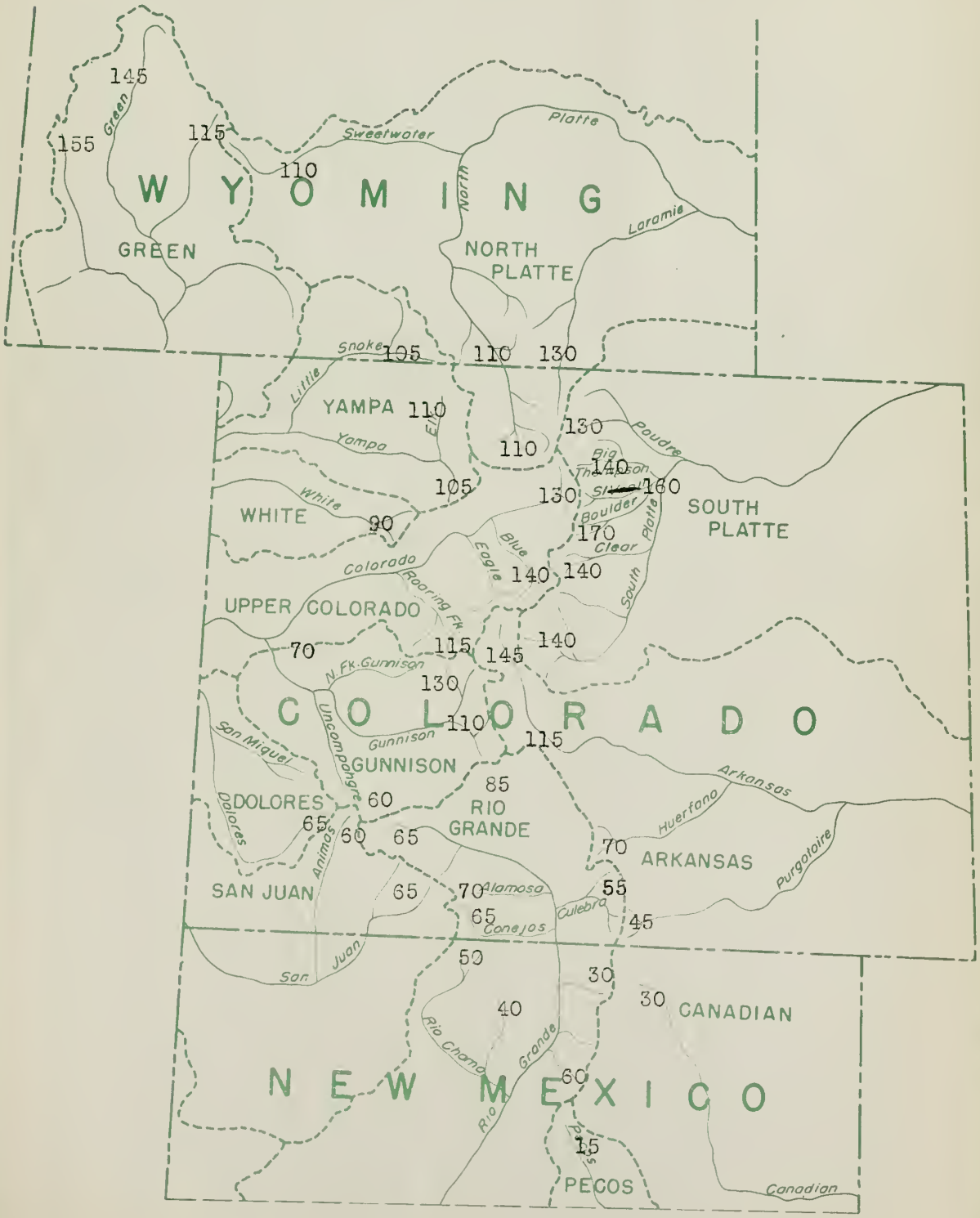
The general water supply outlook for the Rio Grande drainage is critically unfavorable at this time. A series of dry years has depleted reservoir storage and very little summer runoff may be expected from the current snow cover. An extreme curtailment of water use, especially in New Mexico, appears inevitable.

CANADIAN DRAINAGE

There is very little snow on Canadian River tributaries. Soil moisture conditions are reported as fair in the Tucumcari project. Storage in Conchas reservoir is now 281,000 acre-feet as compared to 308,000 acre-feet a year ago.

WATER CONTENT OF SNOW ON THE WATERSHEDS OF PLATTE, ARKANSAS, UPPER COLORADO AND RIO GRANDE BASINS BASED ON SNOW SURVEYS MADE APPROXIMATELY FIRST DAY OF MONTH

In Percent of Normal
April 1, 1951



RIO GRANDE DRAINAGE BASINS

STREAM FLOW FORECASTS, April 1, 1951

	April-Sept., Incl., Streamflow, Acre Feet				
	Forecast 1951	1950	1949	1948	10-year Avg. 1940-1949
RIO GRANDE					
South Fork at South Fork	90,000		197,000	192,000	142,000
Rio Grande at Del Norte	325,000	397,000	832,000	823,000	604,000
Alamosa above Terrace Res.	45,000		105,000	100,000	81,000
Conejos at Mogote	140,000	148,000	268,000	262,000	224,000
Culebra at San Luis	15,000		35,000	36,000	37,000
Rio Chama at Park View	110,000		320,000	222,000	232,000
Costilla at Costilla	15,000	14,840	33,000	35,000	39,000
Taos at Los Cordovas	10,000		28,000	29,000	45,000
Embudo Creek at Dixon	20,000		53,000	65,000	65,000
Rio Grande at Otowi Bridge	175,000*	267,000	948,000	987,000	915,000
Rio Grande at San Marcial	50,000*		852,000	727,000	740,000
Pecos at Pecos	20,000	12,880	79,000	70,000	73,000

*Including change in storage in El Vado Res.

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
RIO GRANDE BASIN

STATUS OF RESERVOIR STORAGE, APRIL 1, 1951

STREAM	RESERVOIR	USABLE CAPACITY	THOUSANDS OF ACRE FEET IN STORAGE				
			About April 1				10-year Ave.
		1000 A.F.	1951	1950	1949	1948	1941-1950
RIO GRANDE							
	Rio Grande	51.3	5.1	30.6	19.5	24.2	19.0
	Santa Maria	45.0	2.9	22.9	15.8	5.7	12.0
	Sanchez	103.0	4.5	113.0	6.2	9.2	14.5
	Terrace	17.7	1.8	4.4	2.2	6.0	3.9
	Continental	26.7	5.0	19.0	6.0	4.0	9.6
	Elephant Butte	2273.7	252.7	656.1	530.0	394.1	957.5
	Caballo	365.0	152.3	221.3	158.9	171.5	230.2
CHAMA RIVER							
	El Vado	226.0	5.1	22.0	19.0	26.8	52.4
CANADIAN RIVER							
	Conchas	600.0	281.3	308.4	306.5	371.0	301.5
PECOS RIVER							
	Alamogordo	148.0		102.7	32.7	35.6	56.2
	McMillan-Avalon	45.0		14.0	6.0	6.0	16.6

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
RIO GRANDE BASIN
April 1, 1951

SUMMARY OF APRIL 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS
BY WATERSHEDS

WATERSHEDS &	Snow Depth			Water Content			Number Courses	Snow Density			1951 Water Content in percent of	
	Eleven year Avg.*	1950	1951	Eleven year Avg.*	1950	1951	in Average	Eleven year Avg.	1950	1951	Eleven Year Avg.*	1950
	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Rio Grande (Colo.)	37.3	28.3	23.2	12.2	10.1	7.7	10	33	36	33	64	76
Upper Rio Grande	41.4	36.5	27.5	13.9	13.5	8.2	3	34	37	30	59	61
Alamosa River	43.6	31.0	27.7	13.4	11.5	9.0	2	31	37	32	67	78
Conejos River	45.8	40.1	28.0	16.1	13.6	11.8	2	35	34	42	73	87
Culebra River	35.3	18.6	17.6	10.7	6.3	6.1	1	30	34	35	57	97
Rio Grande (N.M.)	22.4	9.5	10.8	7.5	3.2	2.8	13	33	34	26	37	88
Chama River	35.9	26.2	18.5	12.8	9.0	6.9	5	36	34	37	54	77
Pecos River	11.9	1.5	2.4	3.8	0.4	0.5	3	32	27	21	13	125
Canadian River	21.4	6.1	9.2	6.9	2.1	2.2	4	32	34	24	32	105

*Some for shorter periods

PRECIPITATION DATA*

WATERSHED	STATE	Precipitation October 1 to March 31	Departure from Normal	Precipitation March	Departure from Normal
		Inches	Inches	Inches	Inches
Canadian	New Mexico	1.78	-2.39	0.72	-0.18
Rio Grande	Colorado	4.40	-4.67	0.52	-1.06
Rio Grande (N)	New Mexico	2.60	-2.99	0.66	-0.52
Rio Grande (S)	New Mexico	1.30	-1.94	0.30	-0.18
Pecos	New Mexico	2.18	-2.14	0.74	-0.28

*Average of Selected High Elevation Stations.

RIO GRANDE DRAINAGE SNOW SURVEYS
April 1, 1951

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Cover Measurements: Water Content (Inches) 1951	1950	1949	Past Record: Yrs. of Rec.	Av. Water Content (Inches)
RIO GRANDE IN COLORADO												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	3/30	64.4	20.3	31.2	42.3	15	30.6
Upper Rio Grande	27 "	13	40N	4W	9350	4/1	12.5	2.8	6.2	11.9	15	6.7
Silver Lakes	47 "	15	36N	5E	9600	3/30	11.4	3.4	2.2	10.4	14	5.9
River Springs	49 "	25	33N	6E	9300	4/2	13.7	4.0	7.0	10.6	14	7.4
La Veta Pass #2	74 "	22	28S	70W	9300	4/2	20.1	5.5	4.2	9.4	15	8.1
Summitville	76 "	30	37N	4E	11500	3/29	44.0	14.5	20.8	29.5	11	20.8
Cumbres Pass #2	77 "	17	32N	5E	10000	4/2	42.2	19.5	20.1	22.7	15	24.7
Santa Maria	80 "	8	41N	2W	9700	5/6	5.6	6.1	6.3	13.0	11	4.5
Culebra	82 "		37.2N	105.2W	10000	3/30	17.6	6.1	6.3	13.0	11	10.7
Ft. Garland	84 "	13	29N	72W	8200	3/31	4.0	0.4	0.0	1.9	11	2.8
Platoro	108 "	22	36N	4W	9950	3/30	43.2	12.9	18.4	28.3	2	
West Conejos	109 "	25	35N	4E	9450	3/28	22.2	5.7	3.0	15.9	2	
La Manga	110 "	24	32N	5E	10100	2/28	53.2	15.7	21.1	28.9	2	
Pyramid	122 "	26	41N	5W	10300	4/2	24.6	6.4	7.6	17.2	2	
Spr. Creek Pass	123 "	2	42N	3W	10900	4/3	27.3	7.0	8.2	18.8	2	
Pool Table Mt.	124 "	19	41N	2E	10000	4/2	13.5	3.0	3.0	12.4	2	
Lake Humphreys	125 "	32	40N	1E	9300	4/2	10.5	3.3	2.9	14.5	2	
Cochetopa Pass	126 "	12	45N	3E	10000	3/31	19.5	4.7	3.0	8.3	2	
Howardville	151 "	15	41N	7E	9800	3/30	29.3	9.0	--	--	-	
Red Mt. Pass	153 "	13	42N	8E	11000	3/30	74.0	29.1	--	--	-	
Porcupine	154 "	2	41N	3W	10400	4/3	25.1	6.9	--	--	-	
Wolf Creek Summit	155 "	6	37N	2E	11000	3/30	63.0	19.0	--	--	-	
	Average for drainage						23.2	7.7	10.1	16.1		12.2
UPPER RIO GRANDE												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	3/30	64.4	20.3	31.2	42.3	15	30.6
Upper Rio Grande	27 "	13	40N	4W	9350	4/1	12.5	2.8	6.2	11.9	15	6.7
Santa Maria	80 "	8	41N	2W	9700	4/1	5.6	1.6	3.1	9.6	12	4.5
Pyramid	122 "	26	41N	5W	10300	4/2	24.6	6.4	7.6	17.2	2	
Spr. Creek Pass	123 "	2	42N	3W	10900	4/3	27.3	7.0	8.2	18.8	2	
Pool Table Mt	124 "	19	41N	2E	10000	4/2	13.5	3.0	3.0	12.4	2	
Lake Humphreys	125 "	32	40N	1E	9300	4/2	10.5	3.3	2.9	14.5	2	
	Average for drainage						27.5	8.2	13.5	21.3		13.9

RIO GRANDE DRAINAGE SNOW SURVEYS
April 1, 1951

DRAINAGE BASIN and SNOW COURSE	Location					Snow Cover Measurements						
								Water Content (Inches)			Past Record	
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inched)	1951	1950	1949	Yrs. of Rec.	Av. Water Content (Inches)
ALAMOSA RIVER												
Silver Lakes	47 Colo.	15	36N	5E	9600	3/30	11.4	3.4	2.2	10.4	14	5.9
Summitville	76 "	30	37N	4E	11500	3/29	44.0	14.5	20.8	29.5	11	20.8
			Average for drainage				27.7	9.0	11.5	19.9		13.4
CONEJOS RIVER												
River Springs	49 Colo.	25	33N	6E	9300	4/2	13.7	4.0	7.0	10.6	14	7.4
Cumbres Pass #2	77 "	17	32N	5E	10000	4/2	42.2	19.5	20.1	22.7	15	24.7
Platoro	108 "	22	36N	4W	9950	3/30	43.2	12.9	18.4	28.3	2	
West Conejos	109 "	25	35N	4E	9450	3/28	30.6	5.4	3.0	15.9	2	
La Manga	110 "	24	32N	5E	10100	3/28	53.2	15.7	21.1	28.9	2	
		Average for drainage					28.0	11.8	13.6	16.7		16.1
CULEBRA RIVER												
Culebra	82 Colo.		37.2N	105.2W	10000	3/30	17.6	6.1	6.3	13.0	11	10.7
				RIO GRANDE IN NEW MEXICO								
CHAMA RIVER												
Cumbres Pass #2	77 Colo.	17	32N	5E	10000	4/2	42.2	19.5	20.1	22.7	15	24.7
Canjilon	6 N.M.	4	26N	6E	9500	4/1	18.8	7.6	10.4	14.0	14	17.4
Pay Role	15 "	16	28N	7E	9700	3/29	16.3	3.4	7.1	14.8	11	9.7
Chama Divide	17 "	.	36.9N	106.7W	7750	4/4	0.0	0.0	0.0	8.5	11	3.0
Chamita	18 "		36.9N	106.7W	8500	4/4	15.1	4.2	7.3	15.1	1	9.2
Bateman	29 "	5	27N	6E	9300	5/30	24.2	8.9	12.8	--	1	
		Average for drainage					18.5	6.9	9.0	16.0		12.8
PECOS RIVER												
Aspen Grove*	4 N.M.	8	28N	15E	9500	4/1	0.0	0.0	0.6	1.8	14	3.5
Panchuela	20 "	25	24N	16E	9200	4/1	5.5	0.6	0.0	2.4	14	2.1
Big Tesuque*	21 "	23	22N	13E	9000	4/1	1.8	0.3	0.6	5.2	9	5.7
Gallinas	25 "	22	22N	13E	10100	3/29	8.3	1.0	0.0	1.2	3	
		Average for drainage					2.4	0.5	0.4	3.1		3.8

*On adjacent drainage

RIO GRANDE DRAINAGE SNOW SURVEYS
April 1, 1951

Drainage Basin and Snow Course	Location: No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Cover Measurements: Water Content (Inches) 1951	1950	1949	Past Record: Yrs. of record	Av. Water Content (Inches)
					RIO GRANDE IN NEW MEXICO							
Red River	1 N.M.	29	28N	15E	9500	3/29	14.4	2.4	3.5	8.9	14	8.4
Taos Canyon	2 "	10	25N	15E	9000	3.30	14.3	2.5	2.8	3.7	12	7.2
Aspen Grove	4 "	12	18N	10E	9100	4/1	0.0	0.0	0.6	1.8	14	3.5
Lee Ranch	5 "	3	18N	4E	9050	4/1	3.8	1.3	1.5	9.9	14	7.6
Canjilon	6 "	4	26N	5E	9500	4/1	18.8	7.6	10.4	14.0	14	17.4
Hematite Park*	9 "	8	28N	15E	9500	4/1	10.5	2.5	0.0	5.7	14	5.3
Tres Titos	12 "	23	22N	13E	9000	3/29	10.7	2.7	0.2	7.1	13	5.9
Pay Role	15 "	16	28N	7E	9700	3/29	16.3	3.4	7.1	14.8	11	9.7
Chama Divide	17 "		36.9N	106.7W	7750	4/4	0.0	0.0	0.0	13.2	11	3.2
Chamita	18 "		36.9N	106.7W	8500	4/4	15.1	4.2	7.3	15.1	9	9.2
Cordova	19 "	22	22N	13E	10100	3/20	29.3	9.2	7.8	14.2	9	12.6
Panchuela #2	20 "	27	19N	12E	8300	4/1	5.5	0.6	0.0	2.4	14	2.1
Big Tesuque	21 "	17	18N	11E	10000	4/1	1.8	0.3	0.6	5.2	9	5.7
Elk Cabin	24 "	8	18N	11E	8250	4/1	0.0	0.0	0.0	2.2	3	
Rio En Medio	26 "	8	18N	11E	10400	4/1	9.2	2.6	2.2	—	1	
Quemazon	28 "	34	20N	5E	9500	3/31	16.2	4.3	3.5	—	1	
Bateman	29 "	5	26N	6E	9300	3/30	24.2	8.9	12.8	—	1	
Costilla	30 "	-	37.0N	105.5	10000	3/27	0.0	0.0	--	--	--	
		Average for drainage					10.8	2.8	3.2	8.9		7.5
					CANADIAN RIVER							
Hematite Park	9 N.M.	8	28N	15E	9500	4/1	10.5	2.5	0.0	5.7	14	5.3
Ocate Mesa	10 "	25	24N	16E	9200	4/1	6.4	1.5	0.3	3.8	13	3.6
Tres Ritos*	12 "	23	22N	13E	9000	3/29	10.7	2.7	0.2	7.1	13	5.9
Cordova*	19 "	22	22N	13E	10100	3/30	29.3	9.2	7.8	14.2	9	12.6
		Average for drainage					9.2	2.2	2.1	7.7		6.9

*On adjacent drainage

Federal - State - Private

COOPERATIVE SNOW SURVEYS

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Furnishes the basic data necessary for forecasting water supply for irrigation, domestic and municipal water supply, hydro-electric power generation, navigation, mining and industry

"WATER IS THE WEST'S GREATEST RESOURCE"